

FIG.1A

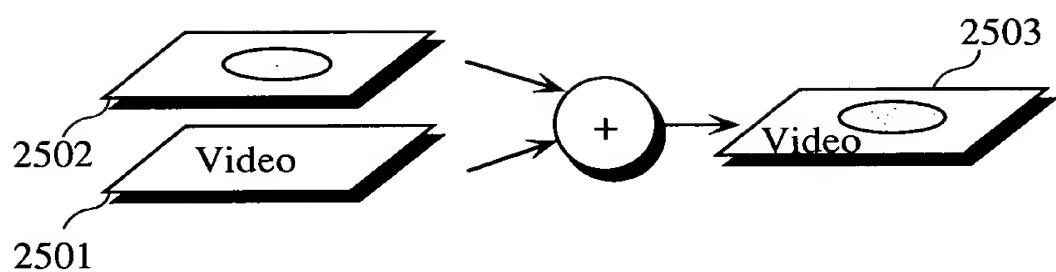


FIG.1B

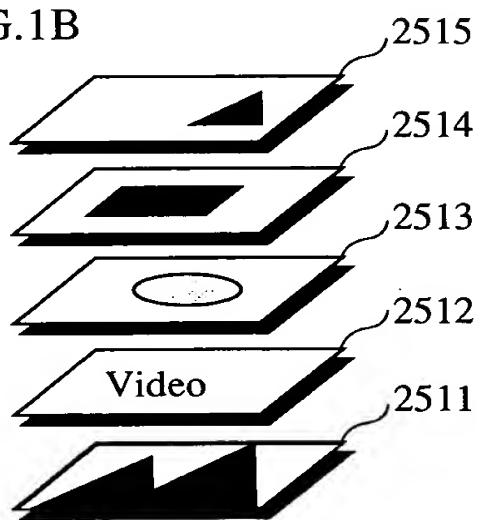


FIG.2

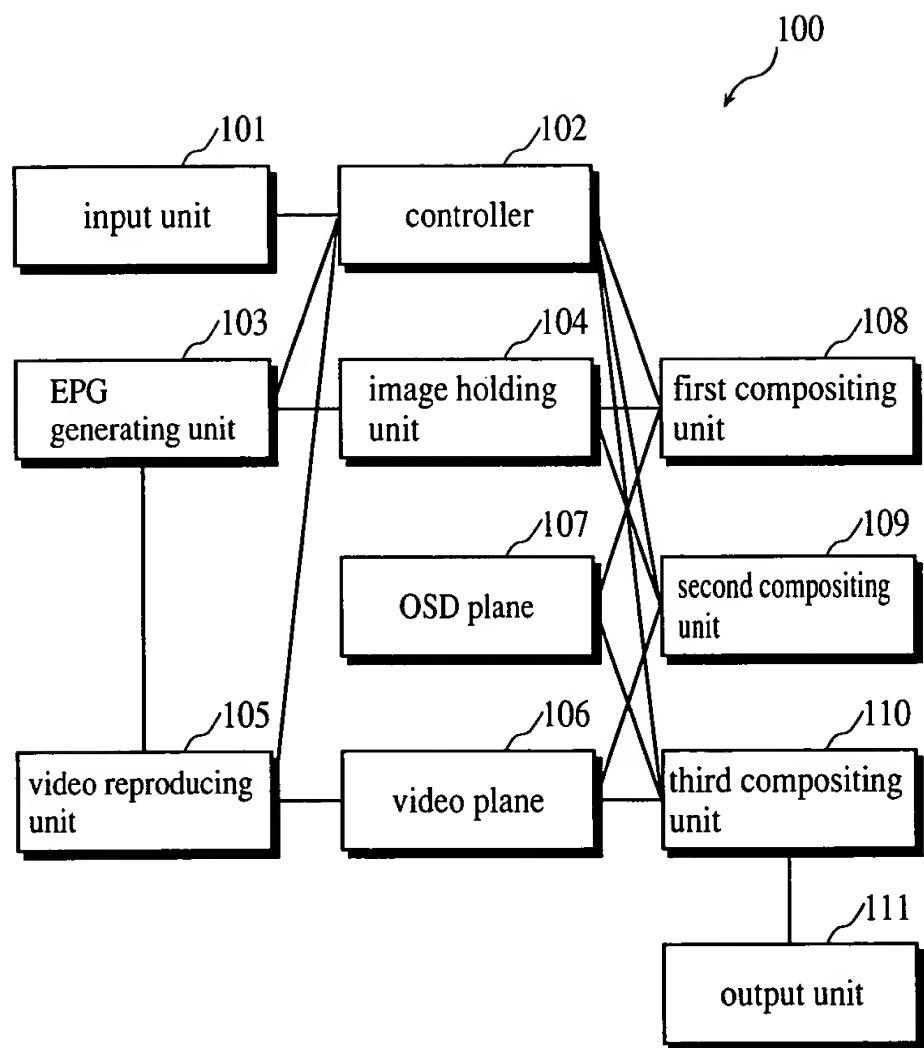


FIG.3A

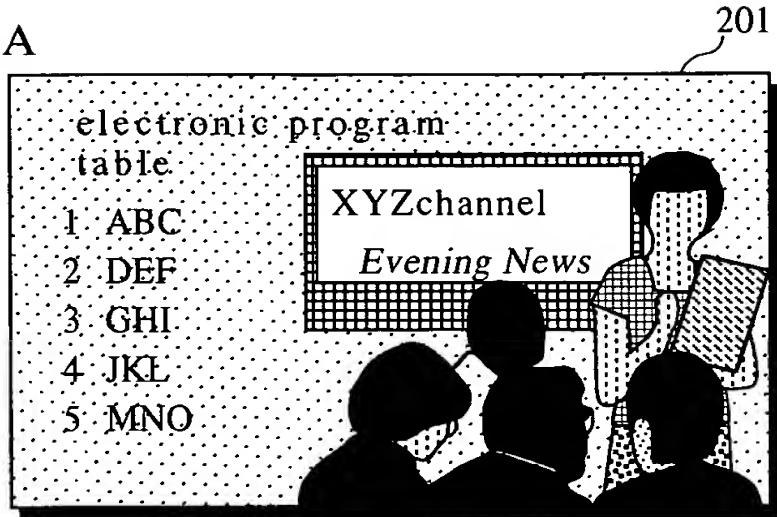


FIG.3B

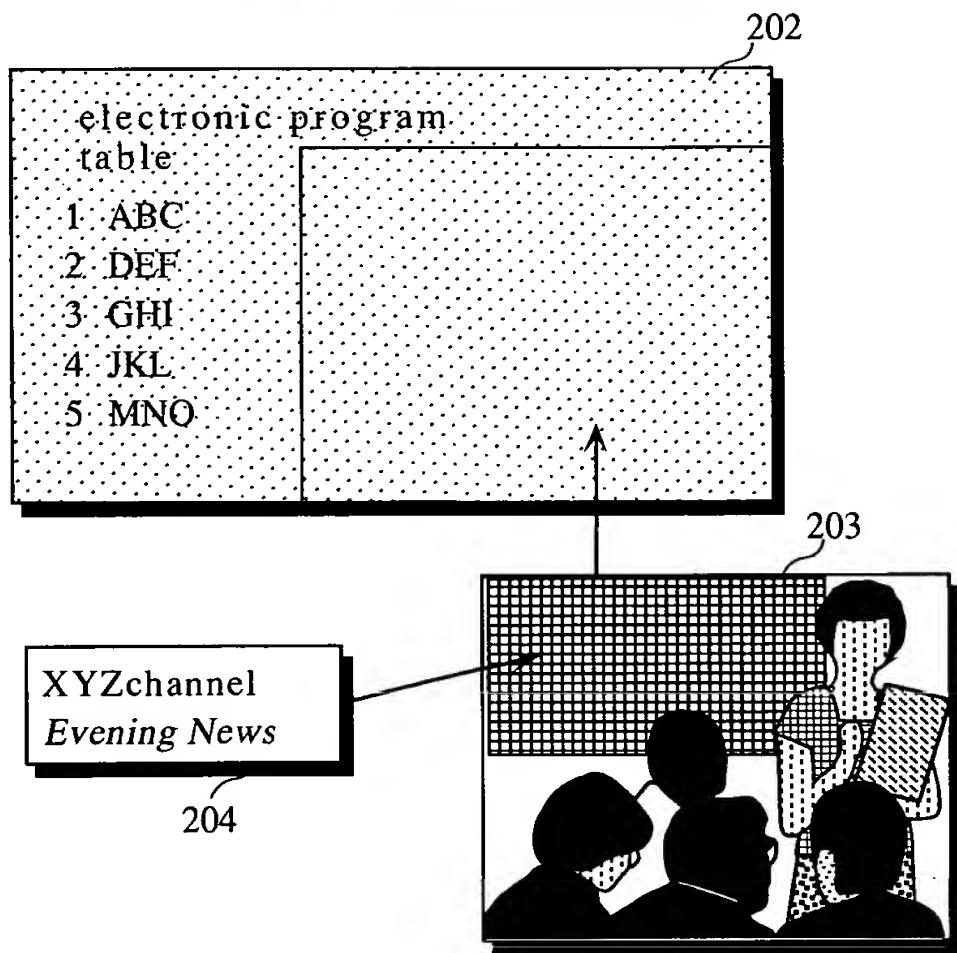


FIG.4

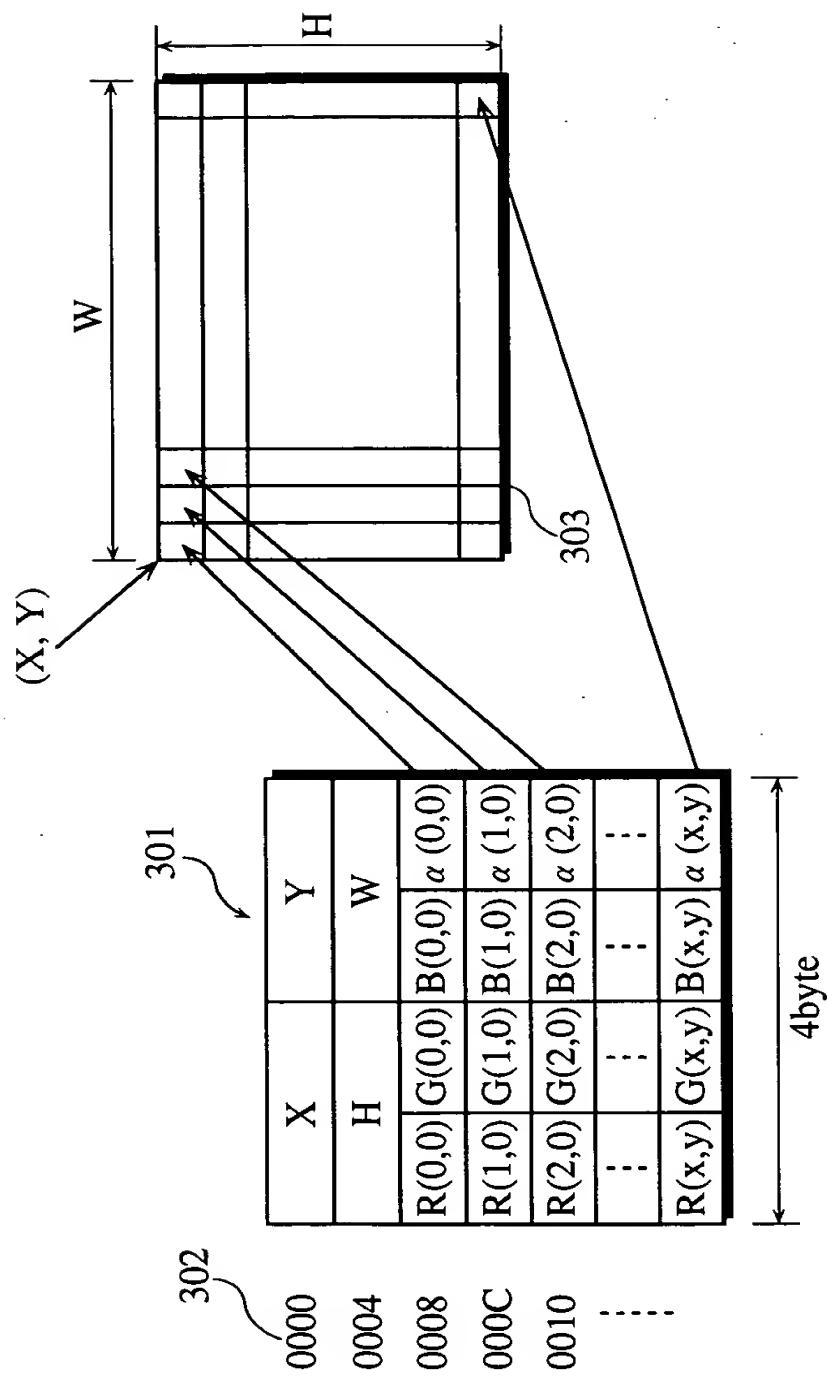


FIG.5

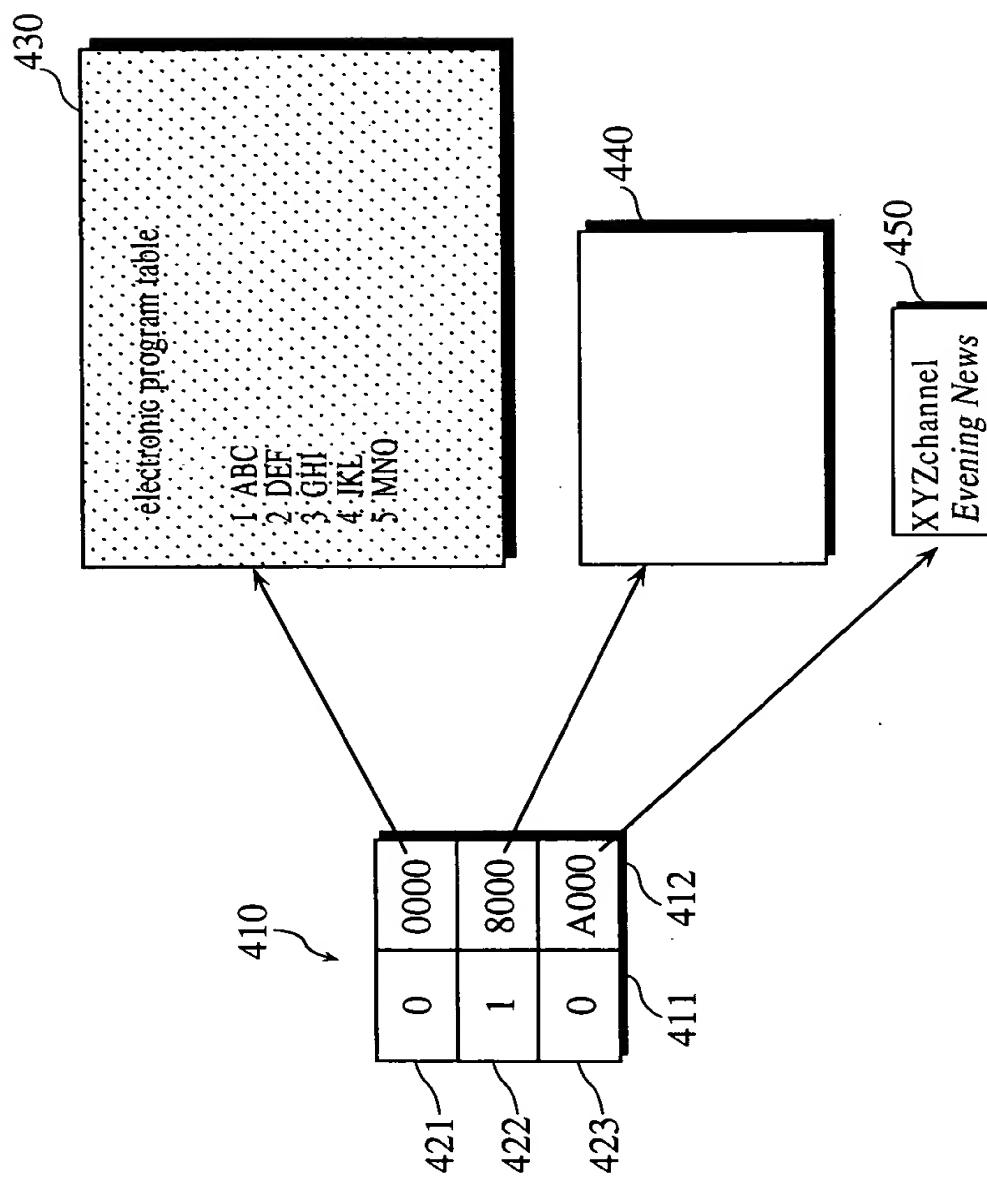
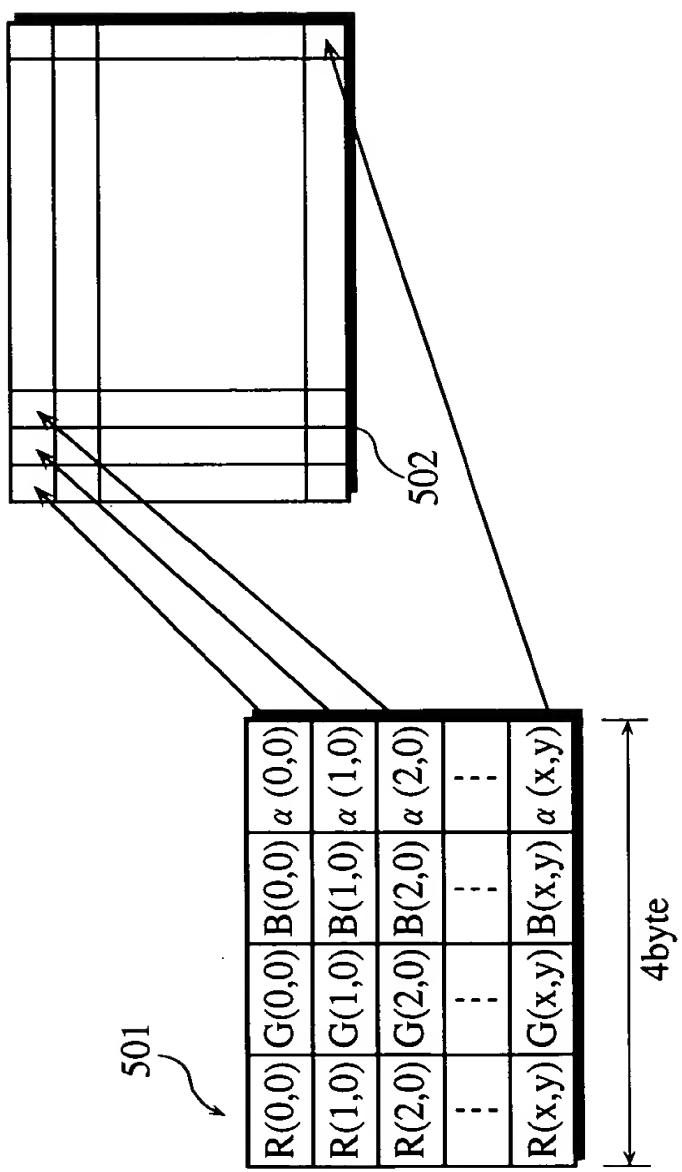


FIG.6



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FIG.7

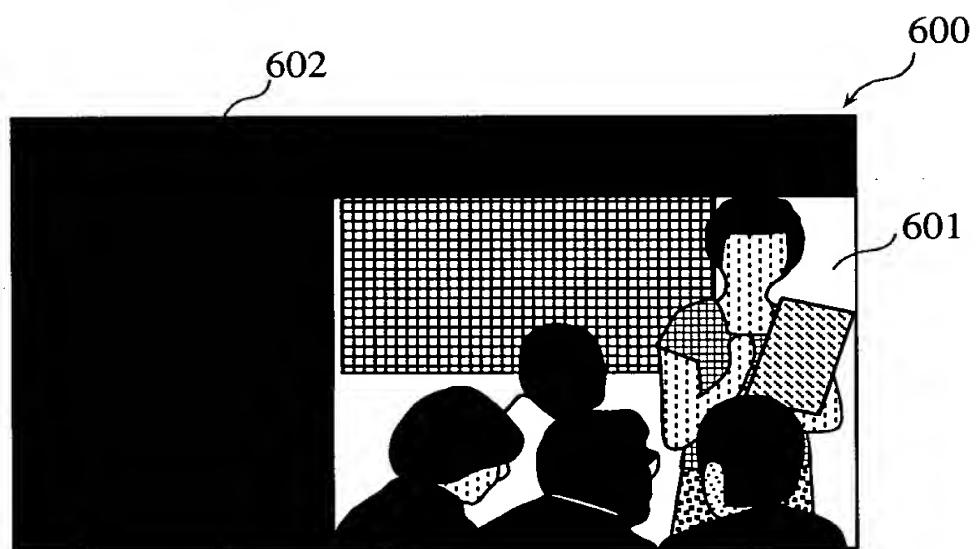


FIG.8

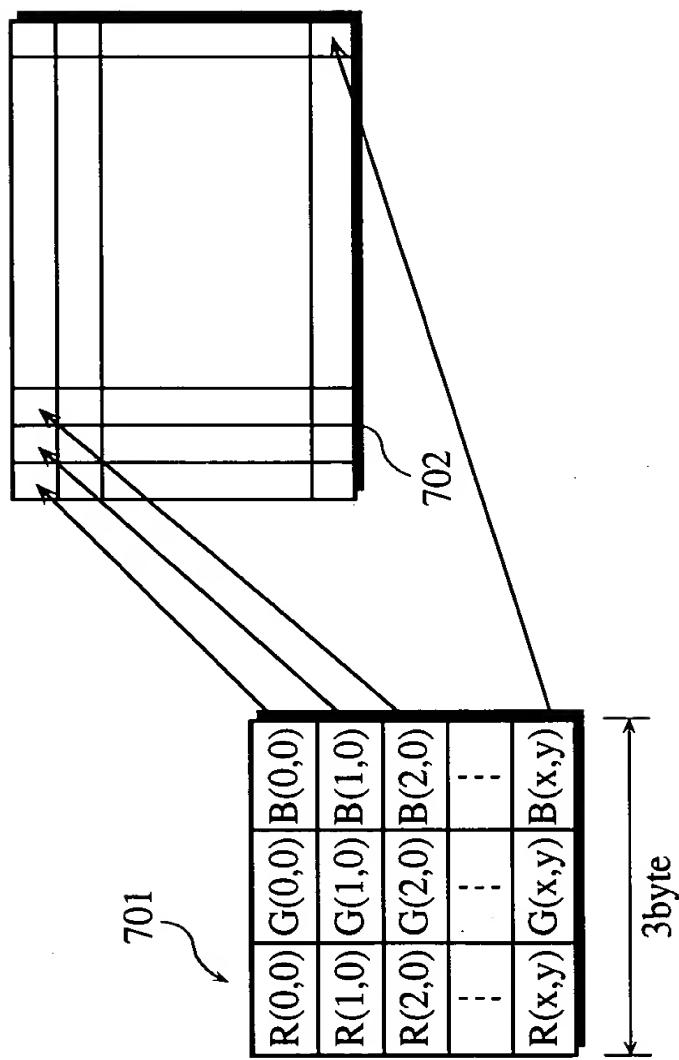


FIG.9

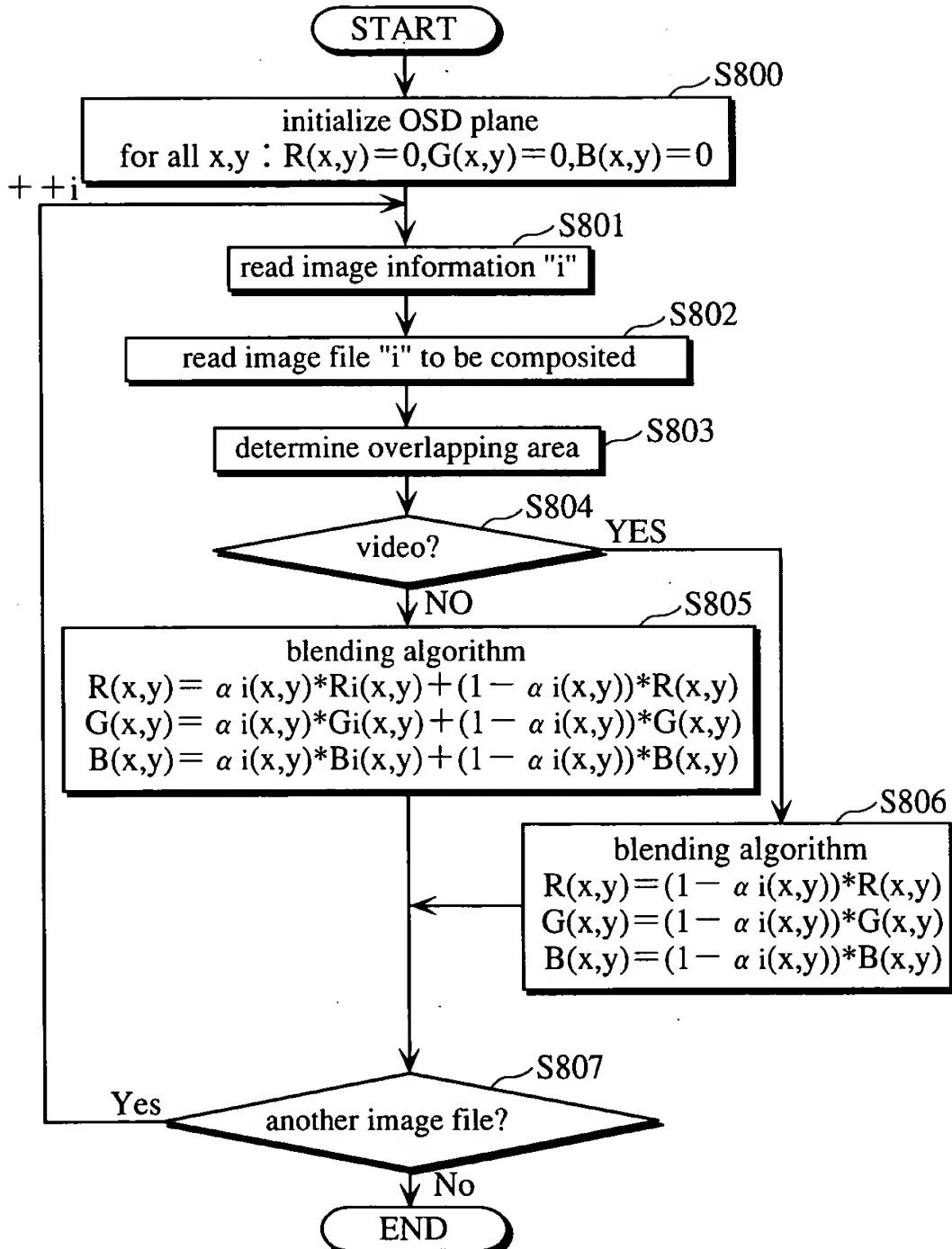


FIG.10

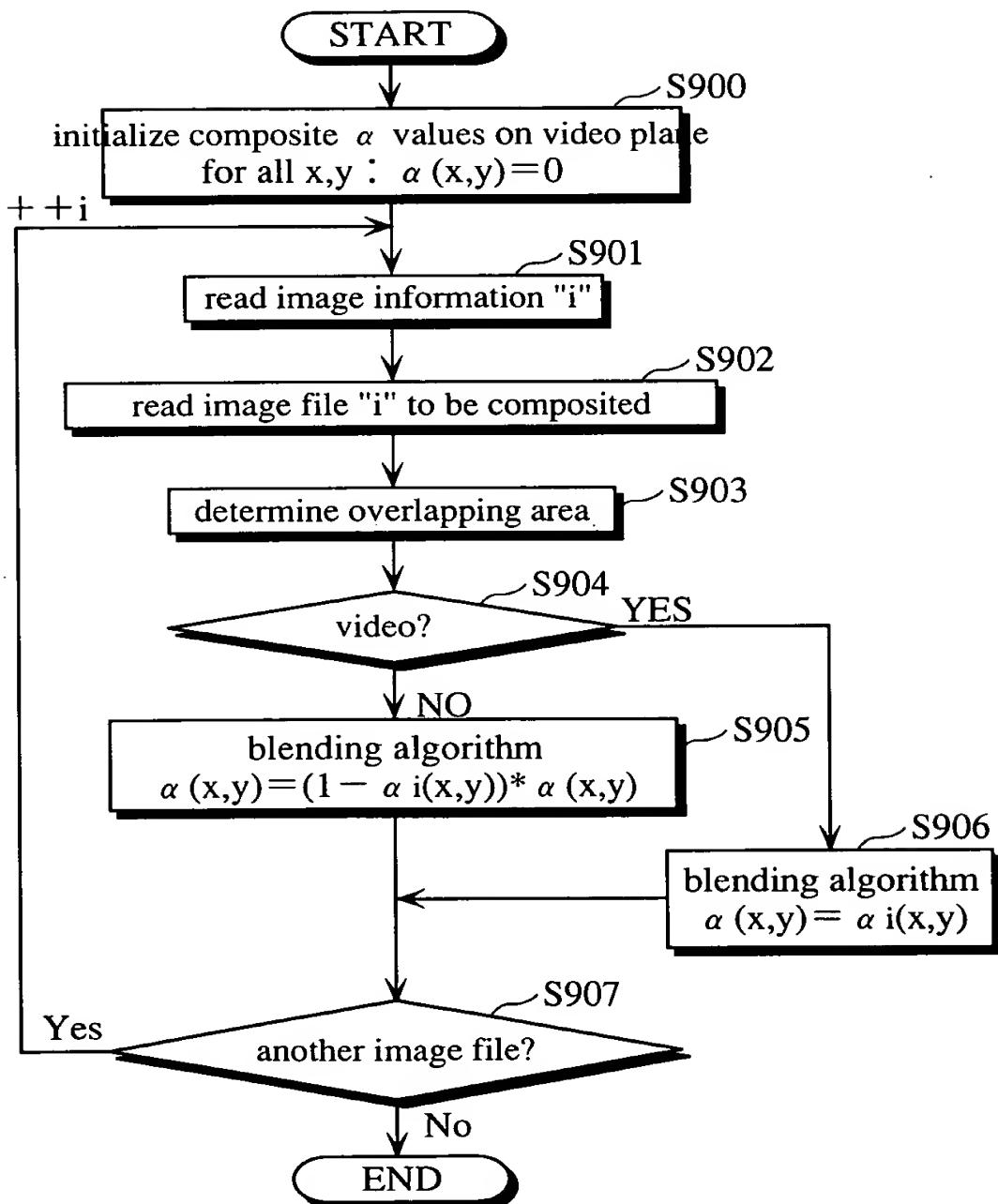


FIG. 11

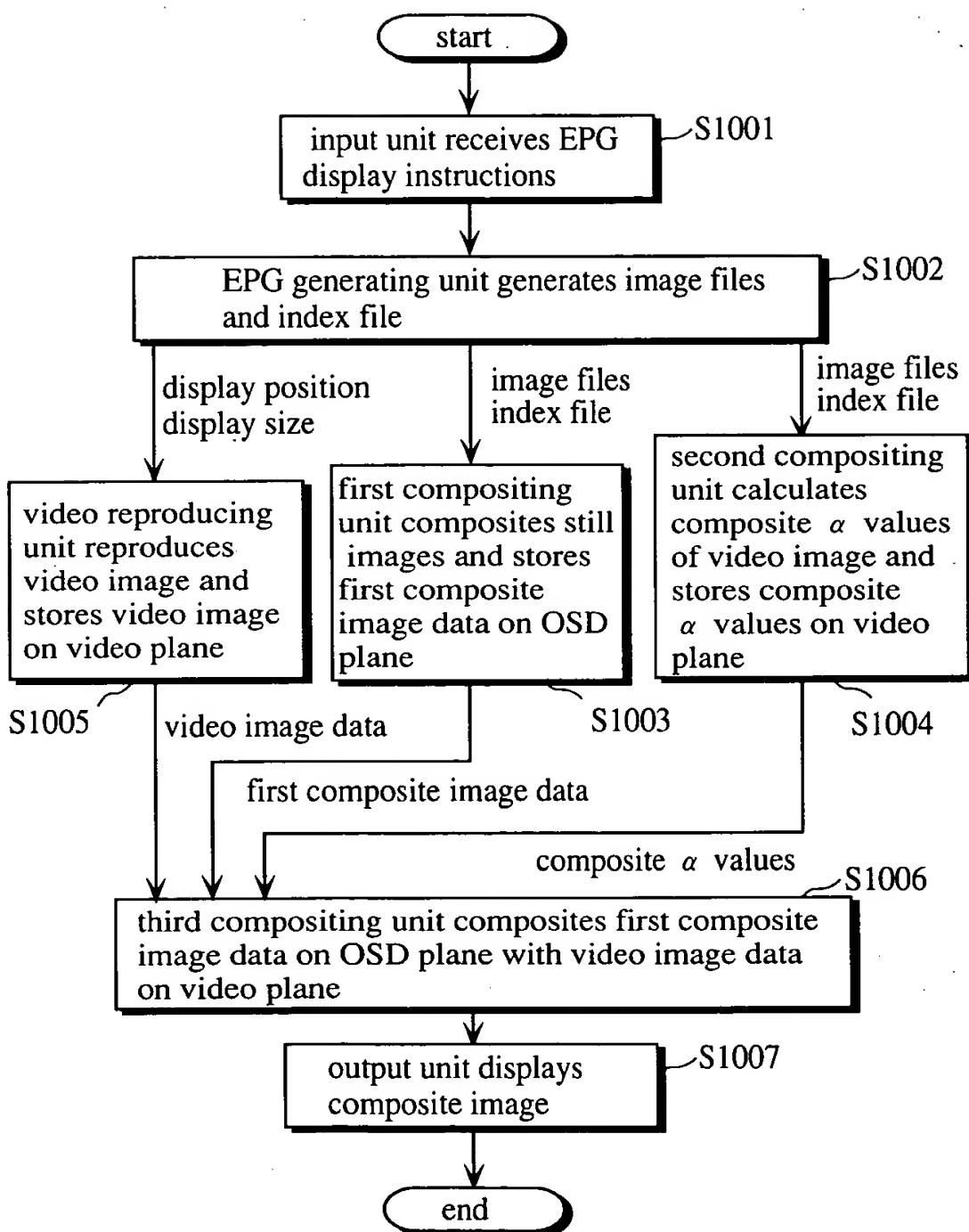


FIG.12

00000000000000000000000000000000

 $R_N, G_N, B_N, \alpha_N$ 

|

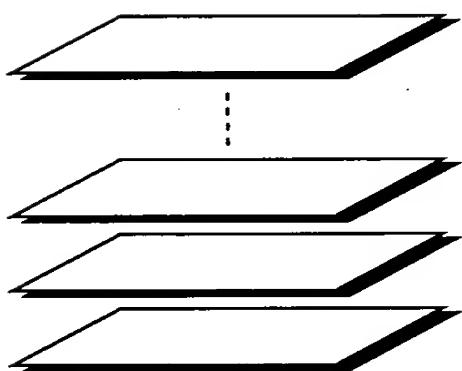
 $R_2, G_2, B_2, \alpha_2$  $R_1, G_1, B_1, \alpha_1$  $R_0, G_0, B_0, \alpha_0$ 

FIG.13

```

1      R=0 ;
2      G=0 ;
3      B=0 ;
4       $\alpha$  =0 ;
5      for (i=0 ; i<=N ; i++) {
6          if (VIDEO=component i) {
7              R=(1- $\alpha$  i)*R ;
8              G=(1- $\alpha$  i)*G ;
9              B=(1- $\alpha$  i)*B ;
10              $\alpha$  =  $\alpha$  i ;
11         } else {
12             R=  $\alpha$  i*Ri+(1- $\alpha$  i)*R ;
13             G=  $\alpha$  i*Gi+(1- $\alpha$  i)*G ;
14             B=  $\alpha$  i*Bi+(1- $\alpha$  i)*B ;
15              $\alpha$  =  $\alpha$  *(1- $\alpha$  i) ;
16         }
17     }
18     R=R+  $\alpha$  *Rv ;
19     G=G+  $\alpha$  *Gv ;
20     B=B+  $\alpha$  *Bv ;

```

FIG.14

[program 1]

```

1      R=0 ;
2      G=0 ;
3      B=0 ;
4       $\alpha$  =0 ;
5      for (i=0 ; i<=N ; i++) {
6          if (VIDEO=component i) {
7              R=(1- $\alpha$  i)*R ;
8              G=(1- $\alpha$  i)*G ;
9              B=(1- $\alpha$  i)*B ;
10              $\alpha$  =  $\alpha$  i ;
11         } else {
12             R=  $\alpha$  i*Ri+(1- $\alpha$  i)*R ;
13             G=  $\alpha$  i*Gi+(1- $\alpha$  i)*G ;
14             B=  $\alpha$  i*Bi+(1- $\alpha$  i)*B ;
15              $\alpha$  =  $\alpha$  *(1- $\alpha$  i) ;
16         }
17     }

```

[program 2]

```

1      while(true) {
2          R=R+  $\alpha$  *Rv ;
3          G=G+  $\alpha$  *Gv ;
4          B=B+  $\alpha$  *Bv ;
5      }

```

FIG.15

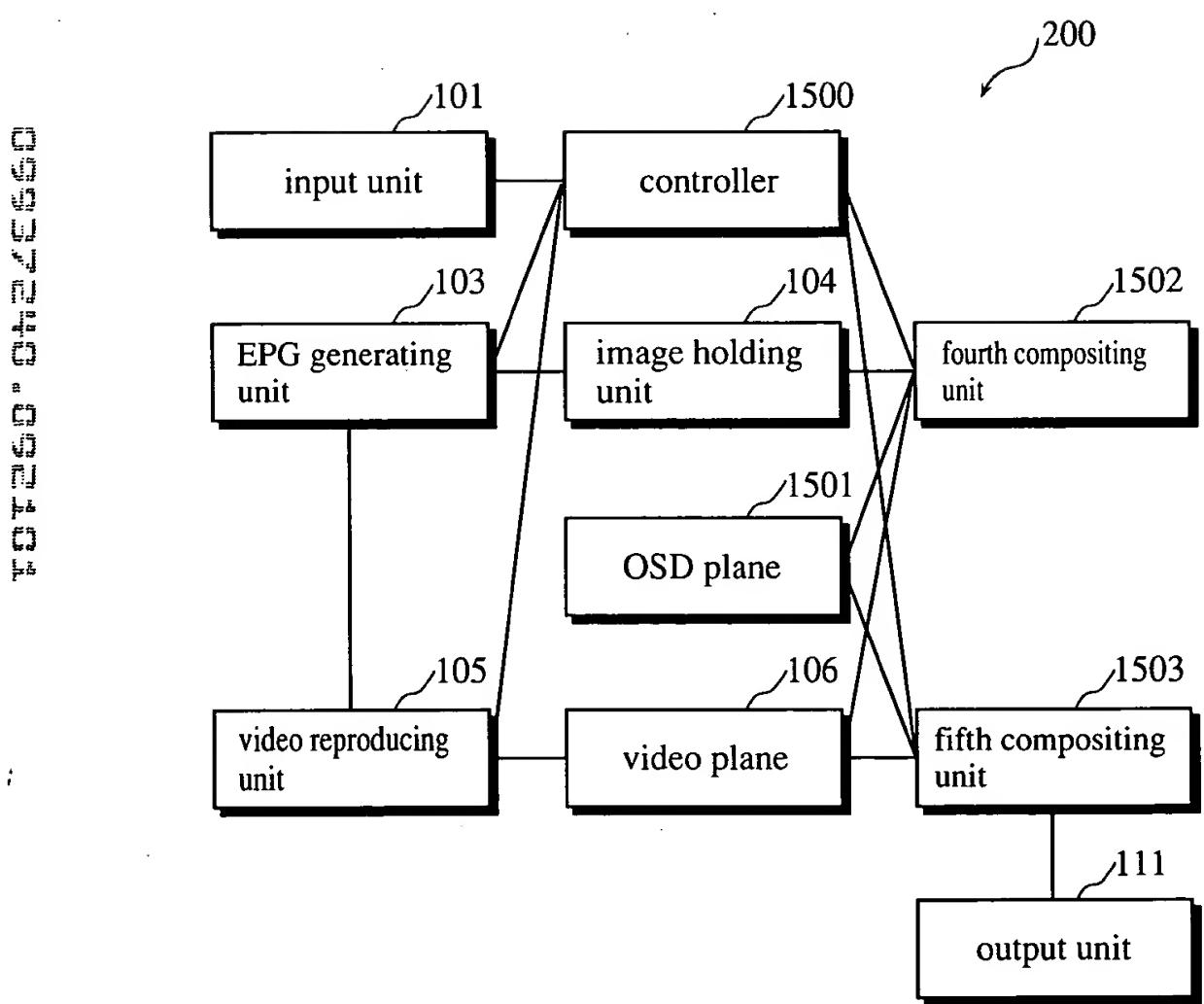


FIG.16

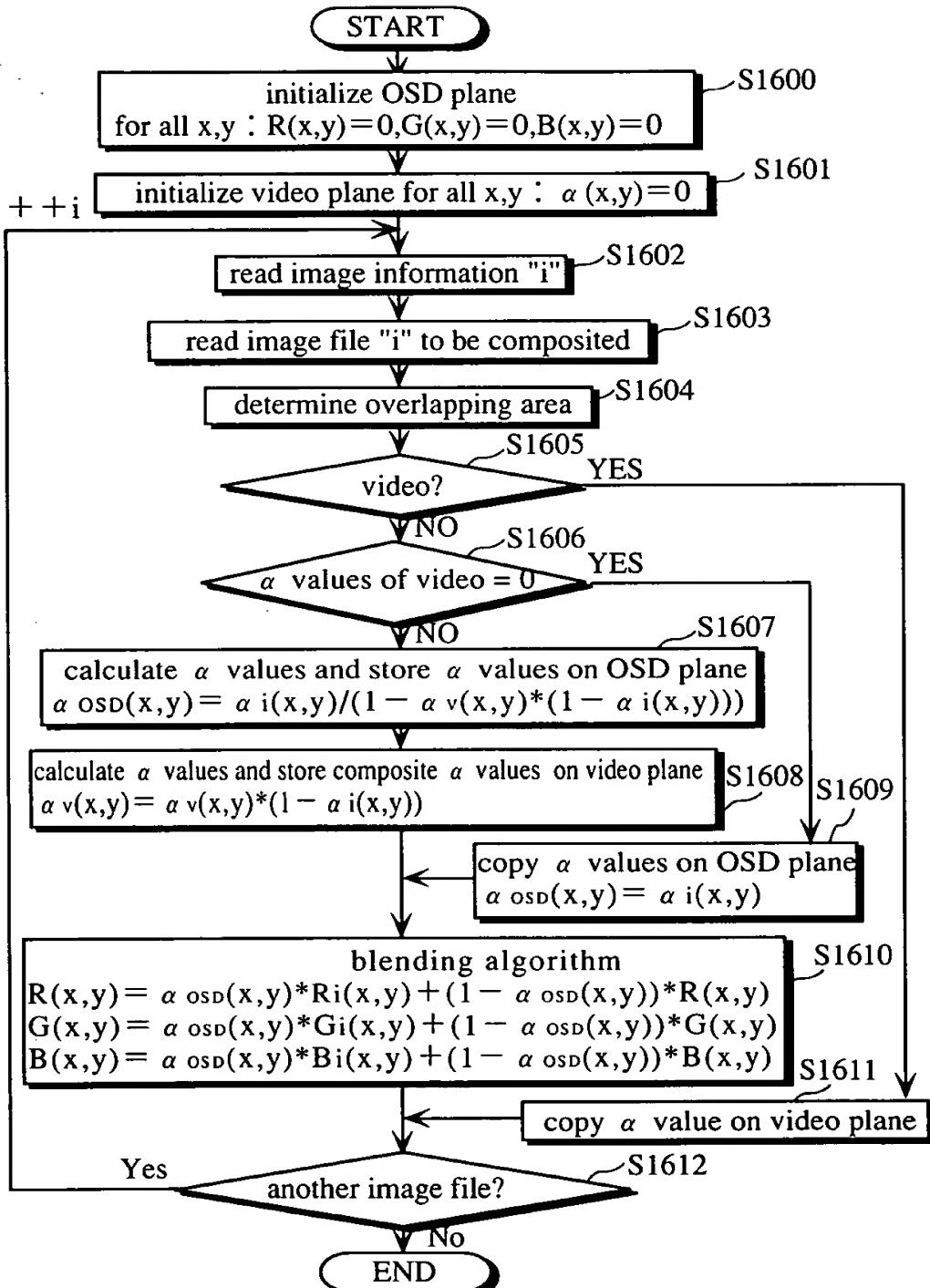


FIG. 17

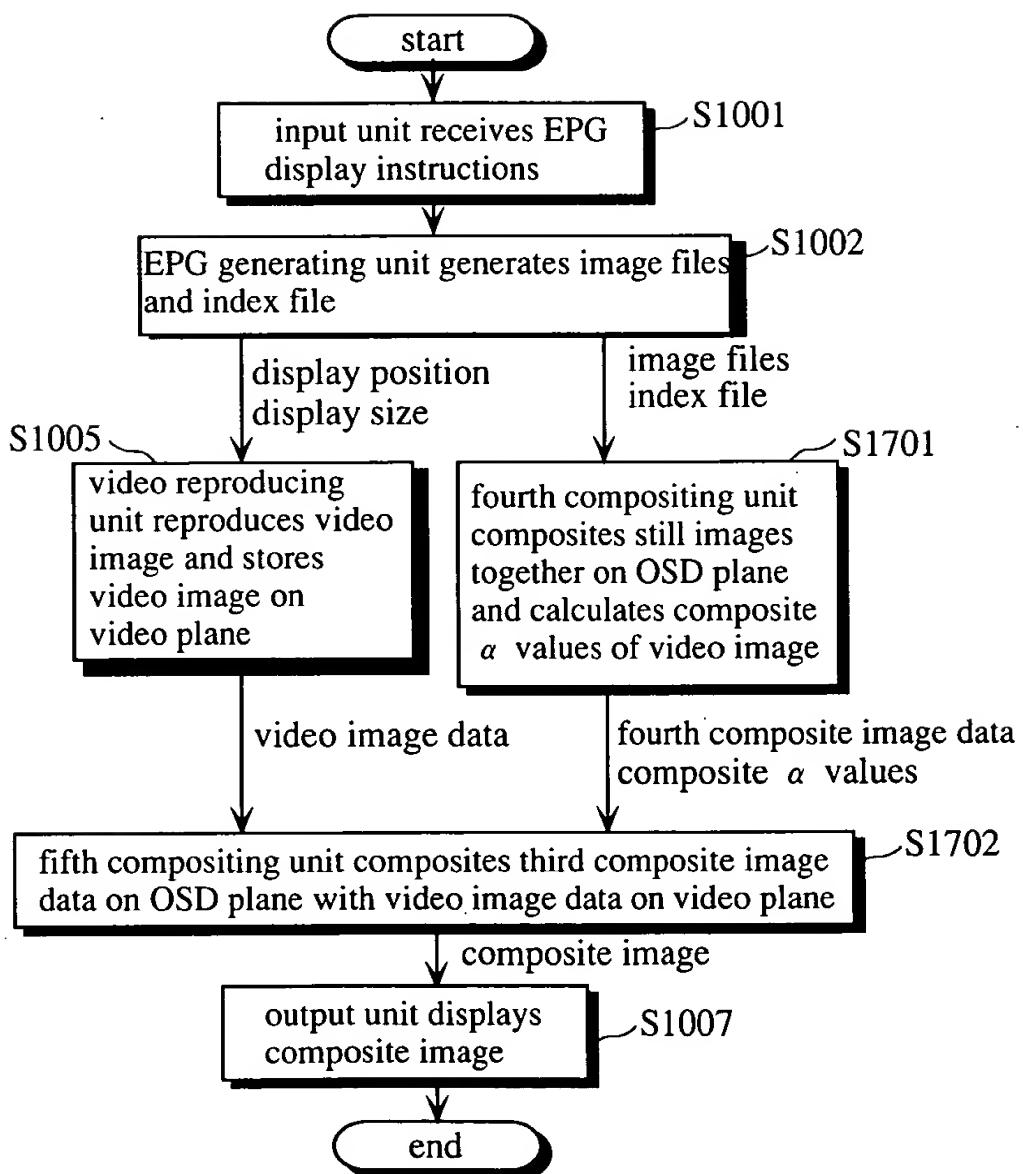
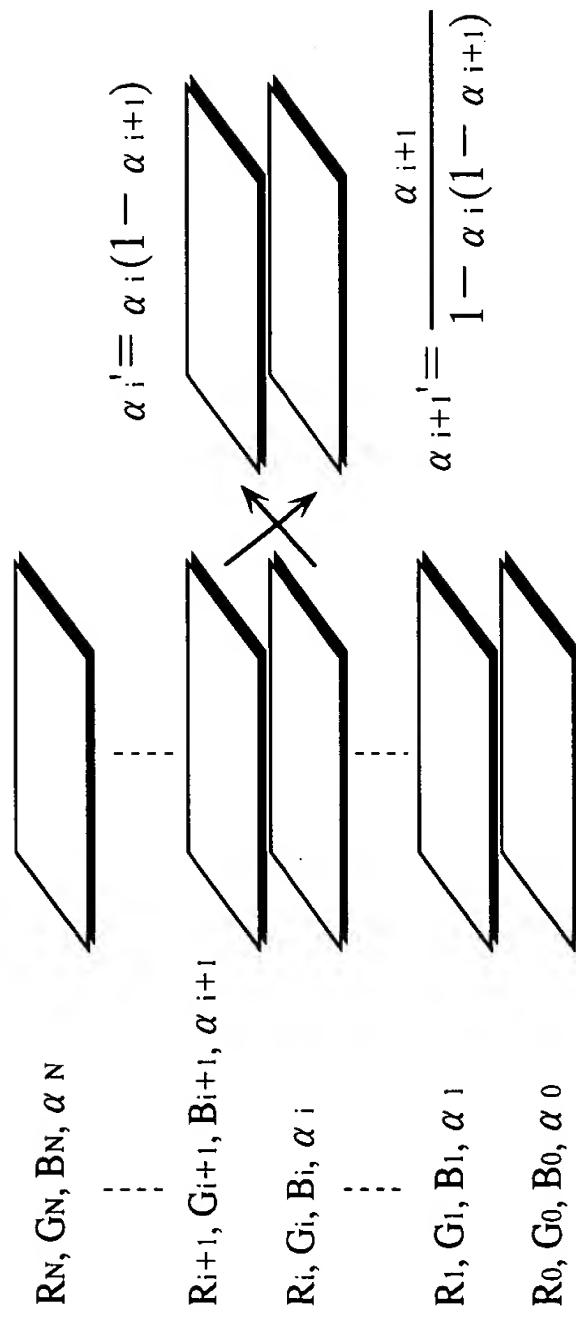


FIG.18



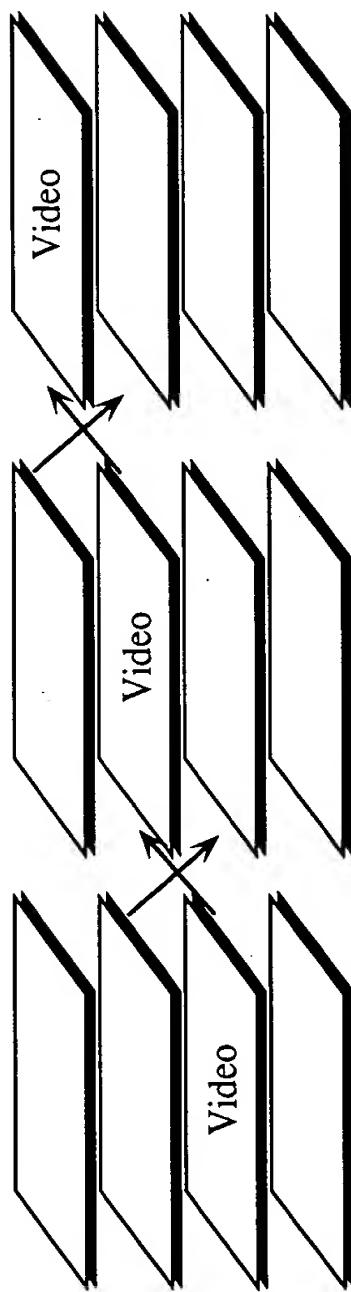


FIG.19

FIG.20

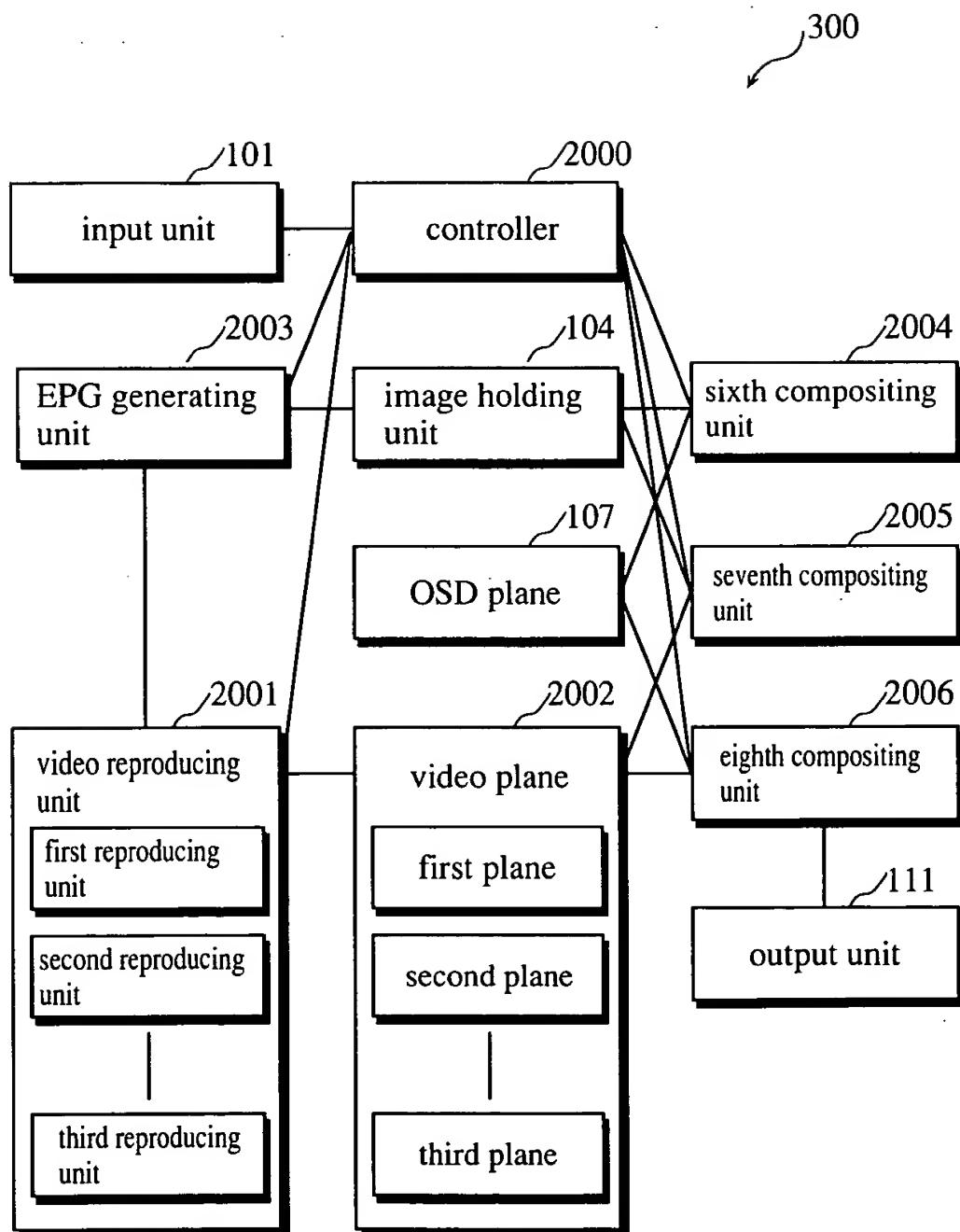


FIG.21

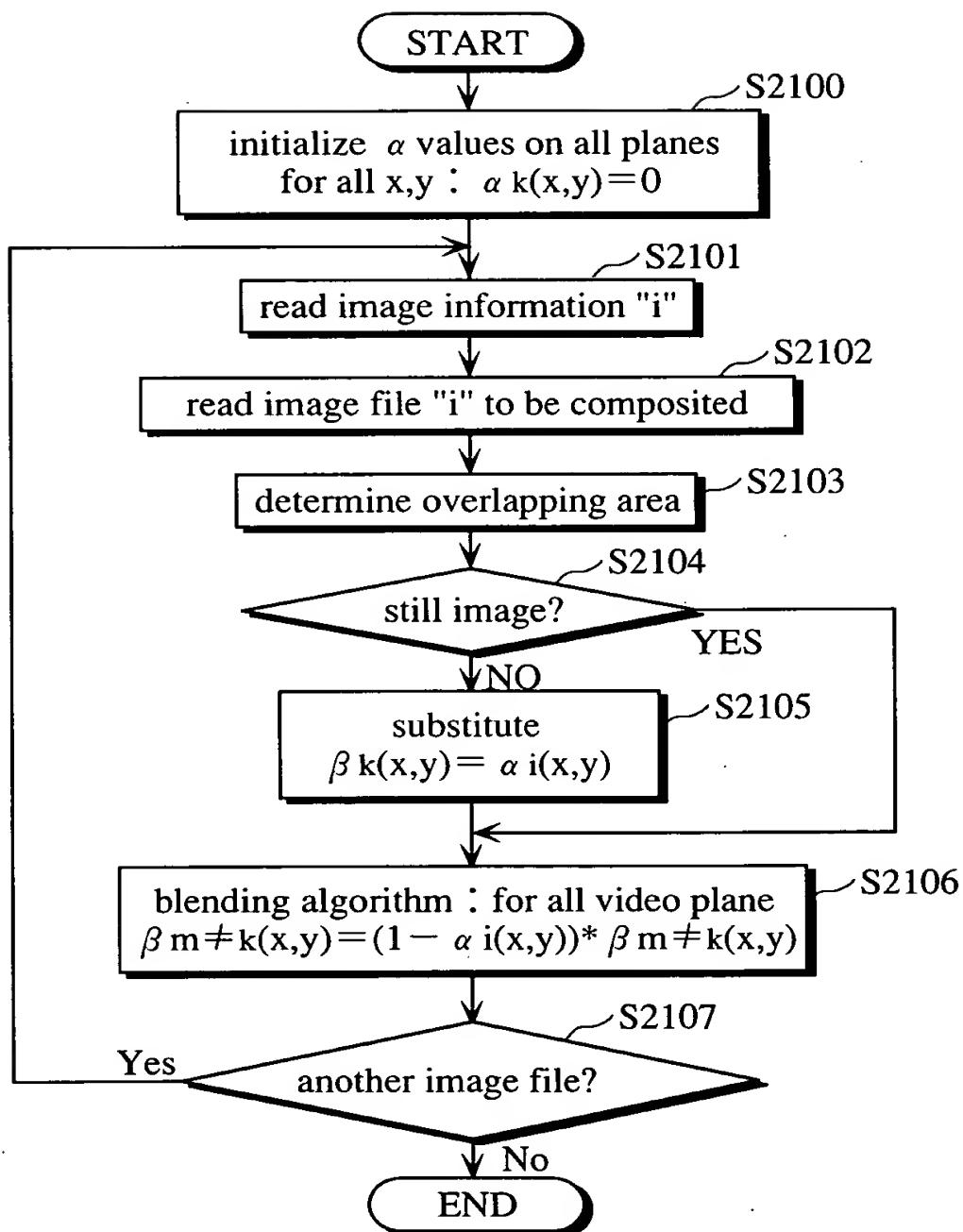


FIG.22

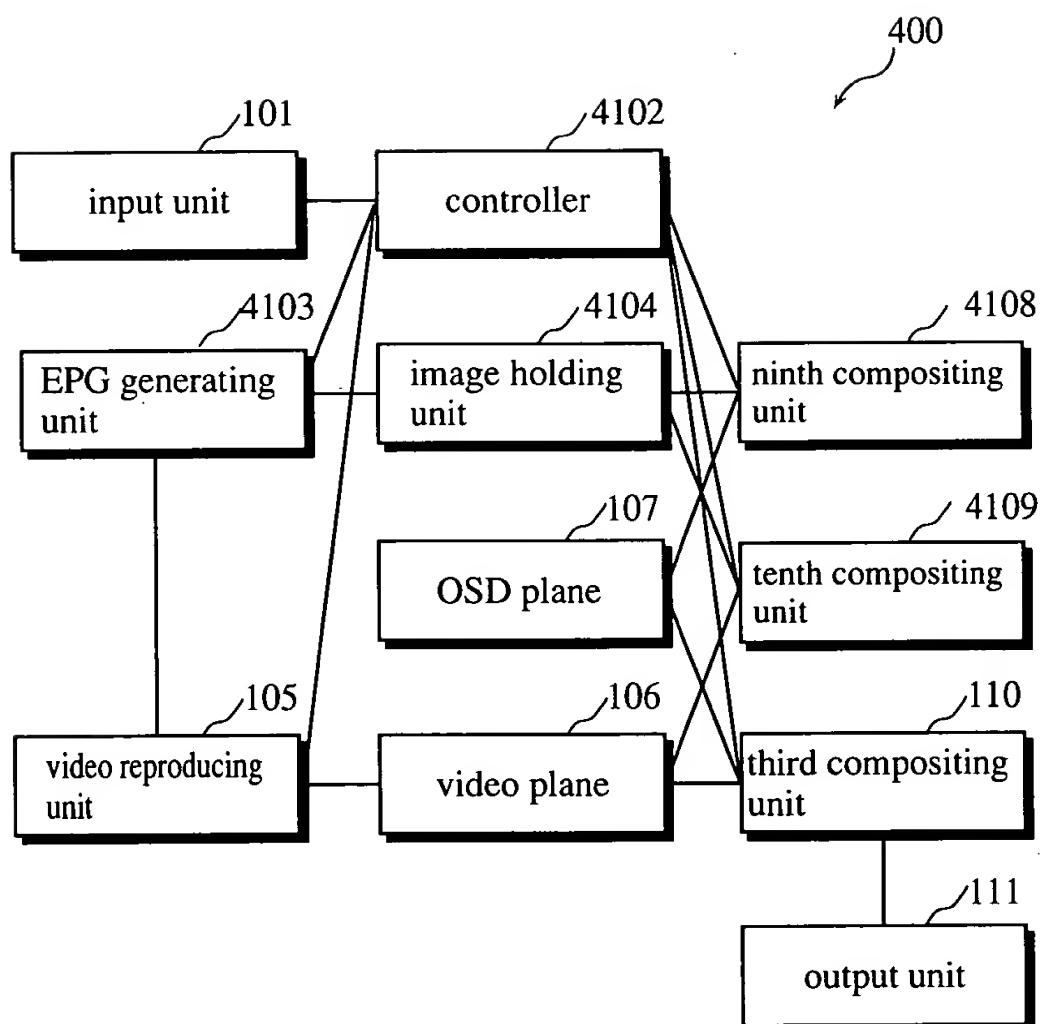


FIG.23A

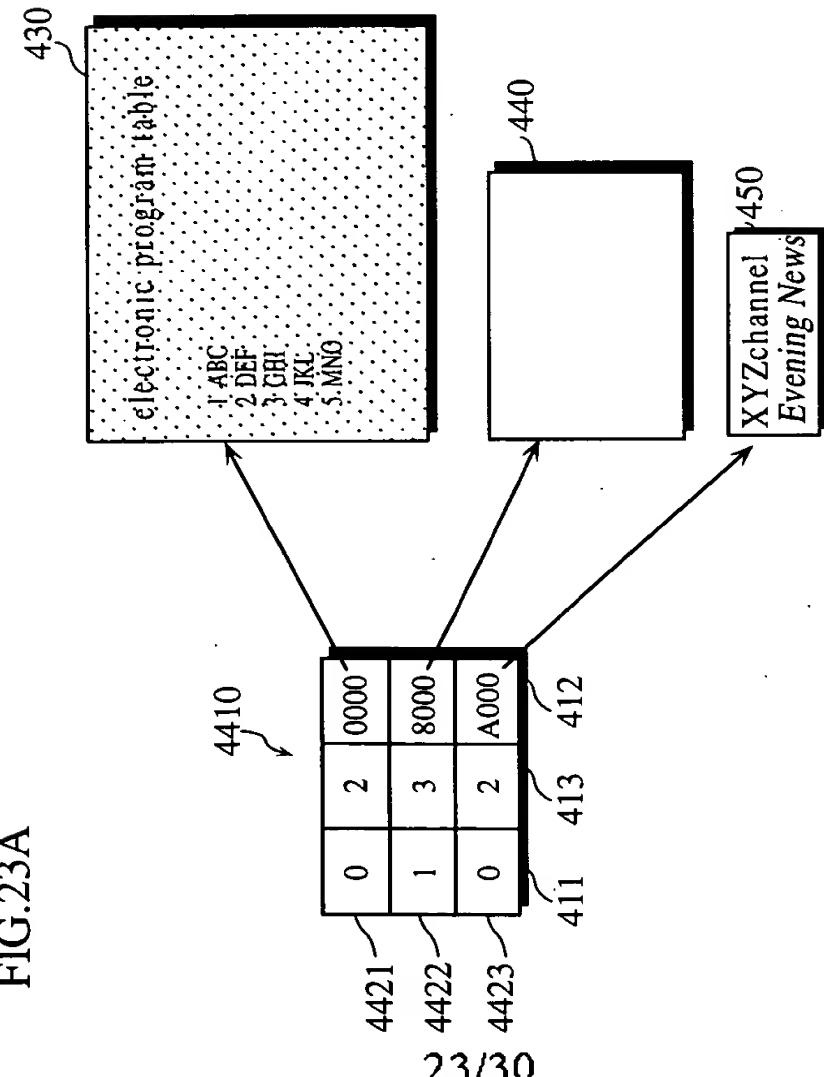


FIG.23B

number	operation type
1	CLEAR
2	SRC
3	SRC_OVER
4	DST_OVER
5	SRC_IN
6	DST_IN
7	SRC_OUT
8	DST_OUT

FIG.24

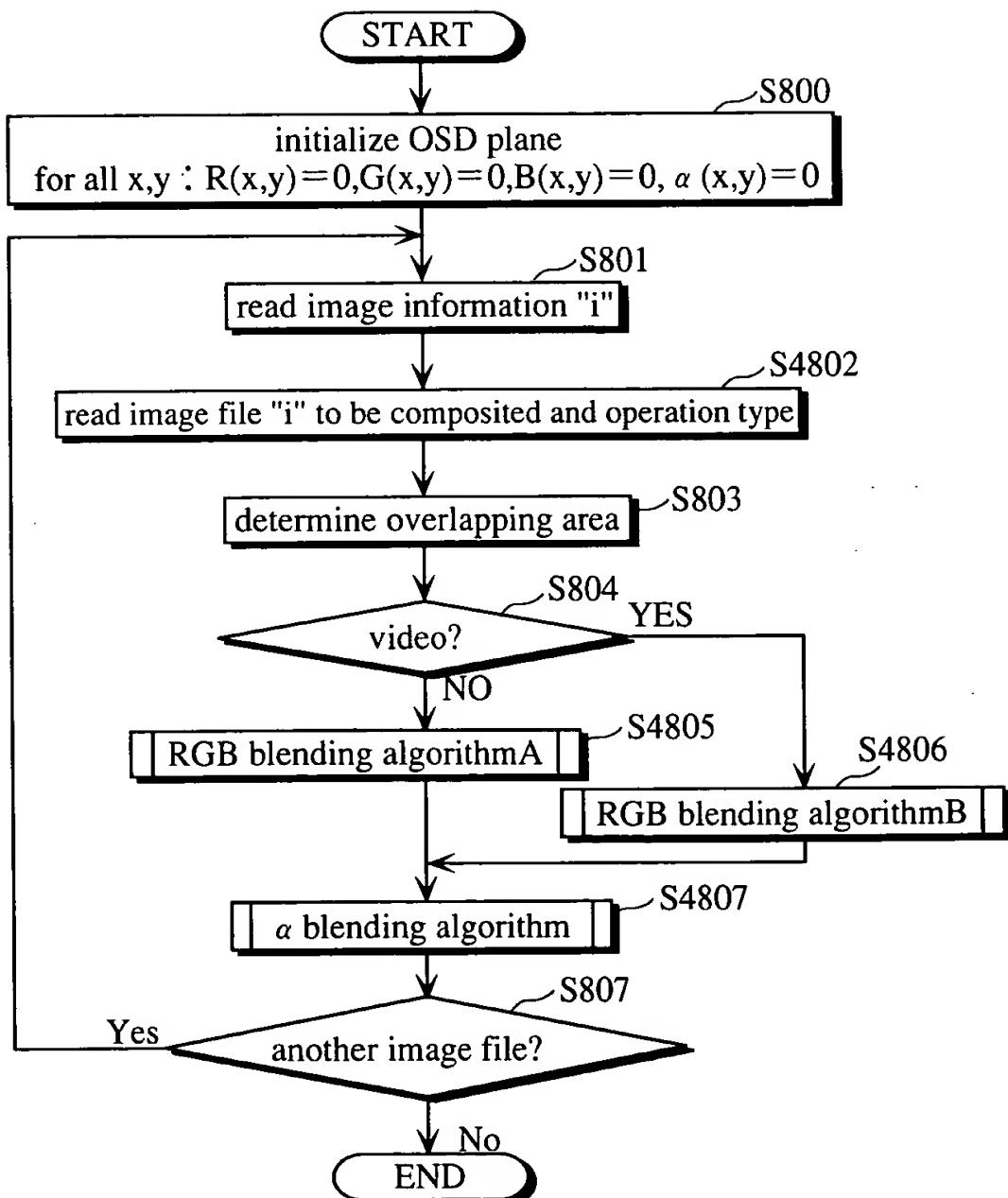


FIG.25

operation type	operation
CLEAR	$R=0, G=0, B=0$
SRC	$R=\alpha_i \cdot R_i, G=\alpha_i \cdot G_i, B=\alpha_i \cdot B_i$
SRC_OVER	$R=\alpha_i \cdot R_i + (1-\alpha_i) \cdot R, G=\alpha_i \cdot G_i + (1-\alpha_i) \cdot G_i,$ $B=\alpha_i \cdot B_i + (1-\alpha_i) \cdot B$
DST_OVER	$R=R + (1-\alpha) \cdot \alpha_i \cdot R_i, G=G + (1-\alpha) \cdot \alpha_i \cdot G_i,$ $B=B + (1-\alpha) \cdot \alpha_i \cdot B_i,$
SRC_IN	$R=\alpha \cdot \alpha_i \cdot R_i, G=\alpha \cdot \alpha_i \cdot G_i, B=\alpha \cdot \alpha_i \cdot B_i$
DST_IN	$R=\alpha_i \cdot R, G=\alpha_i \cdot G, B=\alpha_i \cdot B,$ $R=(1-\alpha) \cdot \alpha_i \cdot R_i, G=(1-\alpha) \cdot \alpha_i \cdot G_i,$
SRC_OUT	$B=(1-\alpha) \cdot \alpha_i \cdot B_i$
DST_OUT	$R=(1-\alpha_i) \cdot R, G=(1-\alpha_i) \cdot G, B=(1-\alpha_i) \cdot B$

FIG.26

operation type	operation
CLEAR	$R=0, G=0, B=0$
SRC	$R=0, G=0, B=0$
SRC_OVER	$R=(1-\alpha_i) \cdot R, G=(1-\alpha_i) \cdot G, B=(1-\alpha_i) \cdot B$
DST_OVER	$R=R, G=G, B=B$
SRC_IN	$R=0, G=0, B=0$
DST_IN	$R=\alpha_i \cdot R, G=\alpha_i \cdot G, B=\alpha_i \cdot B$
SRC_OUT	$R=0, G=0, B=0$
DST_OUT	$R=(1-\alpha_i) \cdot R, G=(1-\alpha_i) \cdot G, B=(1-\alpha_i) \cdot B$

FIG.27

operation type	operation
CLEAR	$\alpha = 0$
SRC	$\alpha = \alpha_i$
SRC_OVER	$\alpha = \alpha_i + (1 - \alpha_i) \cdot \alpha$
DST_OVER	$\alpha = \alpha + (1 - \alpha) \cdot \alpha_i$
SRC_IN	$\alpha = \alpha \cdot \alpha_i$
DST_IN	$\alpha = \alpha \cdot \alpha_i$
SRC_OUT	$\alpha = (1 - \alpha) \cdot \alpha_i$
DST_OUT	$\alpha = (1 - \alpha_i) \cdot \alpha$

FIG.28

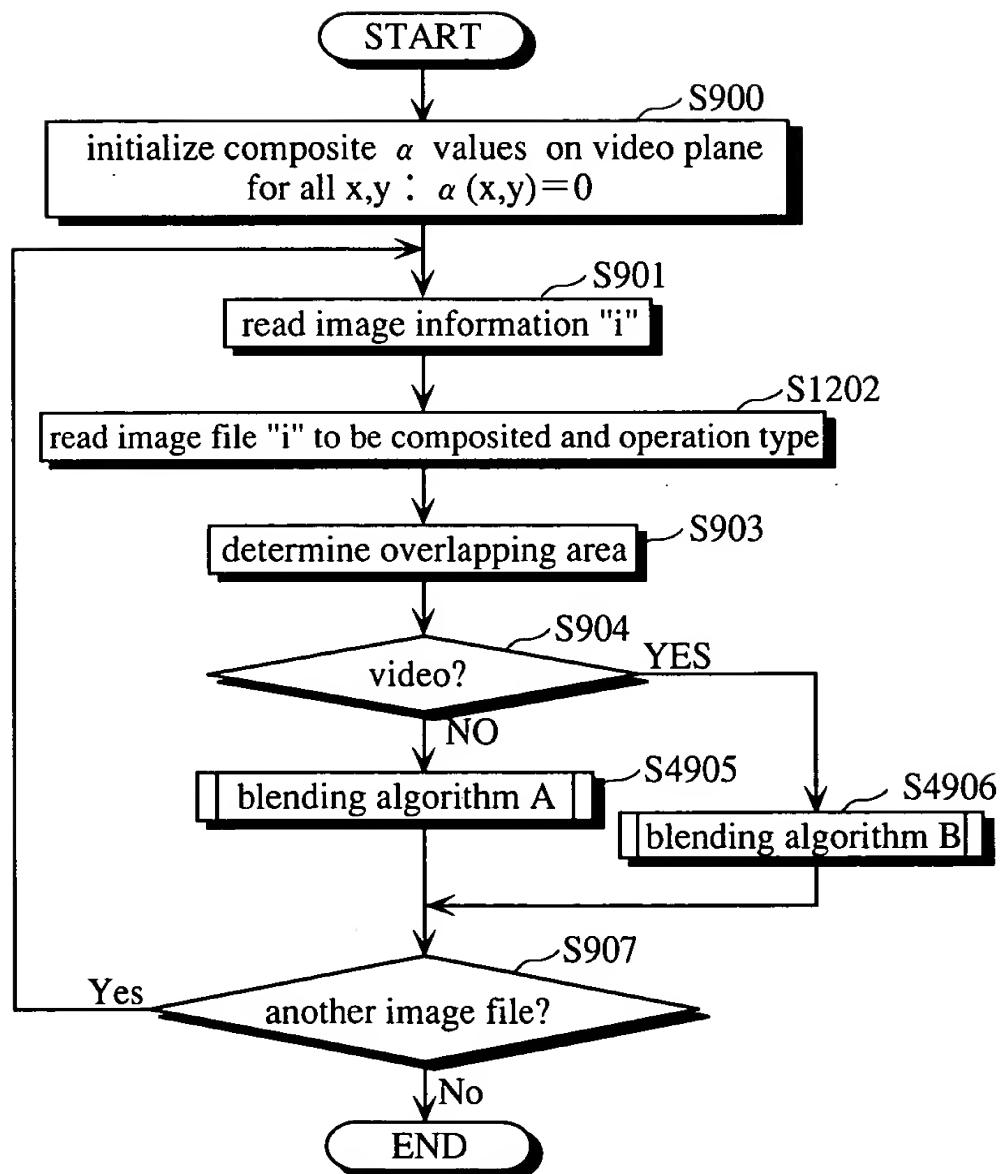


FIG.29

operation type	operation
CLEAR	$\alpha = 0$
SRC	$\alpha = 0$
SRC_OVER	$\alpha = \alpha_i \cdot (1 - \alpha_i)$
DST_OVER	$\alpha = \alpha_i$
SRC_IN	$\alpha = 0$
DST_IN	$\alpha = \alpha_i \cdot \alpha_{osd}$
SRC_OUT	$\alpha = 0$
DST_OUT	$\alpha = (1 - \alpha_i) \cdot \alpha_i$

FIG.30

operation type	operation
CLEAR	$\alpha = 0$
SRC	$\alpha = \alpha_i$
SRC_OVER	$\alpha = \alpha_i$
DST_OVER	$\alpha = \alpha_i \cdot (1 - \alpha_{osd})$
SRC_IN	$\alpha = \alpha_i \cdot \alpha_{osd}$
DST_IN	$\alpha = 0$
SRC_OUT	$\alpha = (1 - \alpha_{osd}) \cdot \alpha_i$
DST_OUT	$\alpha = 0$

FIG.31

```
1      R=0 ;
2      G=0 ;
3      B=0 ;
4       $\alpha$  =0 ;
5       $\alpha$  v=0 ;
6      for (i=0 ; i<=N ; i++) {
7          if (VIDEO=component i) {
8              R,G,B update A
9               $\alpha$  v update A
10         } else {
11             R,G,B update B
12              $\alpha$  v update B
13         }
14          $\alpha$  update
15     }
16     R=R+  $\alpha$  v*Rv ;
17     G=G+  $\alpha$  v*Gv ;
18     B=B+  $\alpha$  v*Bv ;
```